IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Ronald D. Shaw		
Assignee:	Dell Products L.P.		
Title:	System and Method for Communication of Keyboard and Touchpad Inputs as HID Packets Embedded on a SMBus		
Serial No.:	10/723,896	Filing Date:	November 26, 2003
Examiner:	Matthew D. Spittle	Group Art Unit:	2111
Docket No.:	DC-05727	Customer No.:	33438

Austin, Texas
December 2, 2005

MAIL STOP NON-FEE AMENDMENT
COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

DECLARATION OF RONALD D. SHAW UNDER 37 CFR § 1.131

1. My name is Ronald D. Shaw. I am the named inventor of the above-referenced patent application, filed on November 26, 2003, and assigned to Dell Products L.P.

2. I am informed that the Examiner has rejected a number of claims of the above-referenced application based on a slide presentation provided by me in an Information Disclosure Statement. The slide presentation was made by Sundeep Bajikar of Intel Corporation on September 17, 2003. Slide 16 of the Bajikar slide presentation was added from materials presented by me to Intel several months prior to the September 17, 2003 presentation by Bajikar.

3. Attached hereto as Exhibit A is a true and correct copy of an invention disclosure form submitted by me to my employer on July 7, 2003. The invention disclosure form was considered by a Dell patent committee and approved for the filing of a patent application in September of 2003. I worked with Dell's outside patent attorney to prepare and file the above-referenced patent application on November 26, 2003.

4. Attached hereto as Exhibit B is the May 28, 2003 slide presentation prepared by me as referenced in the invention disclosure form.

5. I declare under penalty of perjury by the laws of the United States that the facts stated in this declaration are true and correct.

Ronald D. Shaw

Invention Disclosure Form (Dell Confidential)

DC-05727

EXHIBIT A

Title:

MAPPING HID PROTOCOL ONTO SMBUS FOR TOUCH PAD / KEYSCAN INTERFACE.

INVENTORS

Ronald D Shaw (Dell), Ron_Shaw@dell.com, (512) 728-1922

Line of Business: Advanced Client Engineering
Manager: Richard Schuckle
Reporting Director/VP: Kevin Kettler
Reporting VP/GM: Jeffrey Clarke
Home Phone: 512-249-5477
Citizenship: United States

RELEVANT DATES & DISCLOSURES

Submission Date:	7/7/2003
Conception Date:	5/28/2003
Invention first described in:	Presentation 05/28/2003
First offer for sale:	TBD
First production use/ship date:	TBD
Anticipated offer for sale, production use, or ship date:	TBD

Disclosure outside of Dell? Yes
If yes, to whom? Intel/NSC/SMsC/Renasas/Alps/Synaptics
Was the disclosure made under an NDA? Yes

TECHNOLOGY

Product Line:	Portables
Project Code Name(s):	CY 2005 Notebooks
Relevant Standards:	

WITNESSES

Witness 1:	Thomas Pratt
Witness 2:	William Sauber

THE PROBLEM

Currently the keyboard scans for portables is done by the EC on the motherboard. There is movement in the industry to move the keyboard scanning to the touchpad. This will reduce the number of signals begin transmitted from the palm rest down to the motherboard.

There is also a movement in the industry to develop secure keyboards and secure touchpad for portable computers. The current proposal uses a set of registers which simulate a HID device on the LPC bus similar to the HID devices used on USB.

To minimize the amount of silicon on the motherboard, a simple protocol is needed to allow HID messages to be transmitted from the touchpad to the motherboard.

PRIOR SOLUTIONS/EXISTING TECHNOLOGY

Currently, HID packets are used for USB keyboards and pointing devices.

PROPOSED SOLUTIONS

The touchpad microcontroller will convert the keyboard scan and pointing device inputs into standard HID packets. These HID packets will be embedded into SMBus messages which is passed to the motherboard and transferred into the HID registers which are visible to the firmware and/or software.

By directly mapping HID packets into SMBus messages, a reduction in complexity on the motherboard can be realized. A simple state machine can transfer successful SMBus messages directly into the HID registers.

FIGURES

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Notebook re-Partitioning Keyboard / Touchpad

EXHIBIT B

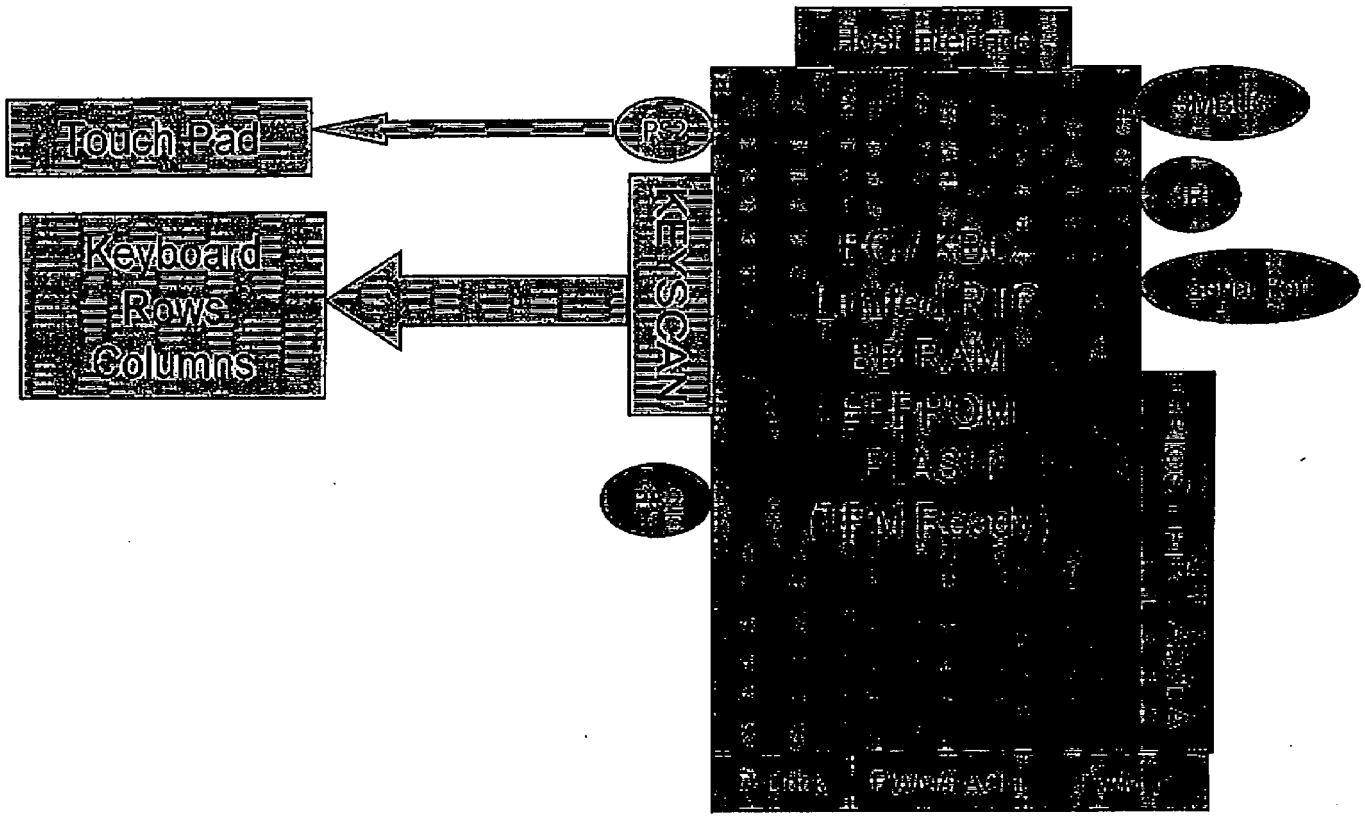
Ron Shaw

Technologist

May 28, 2003

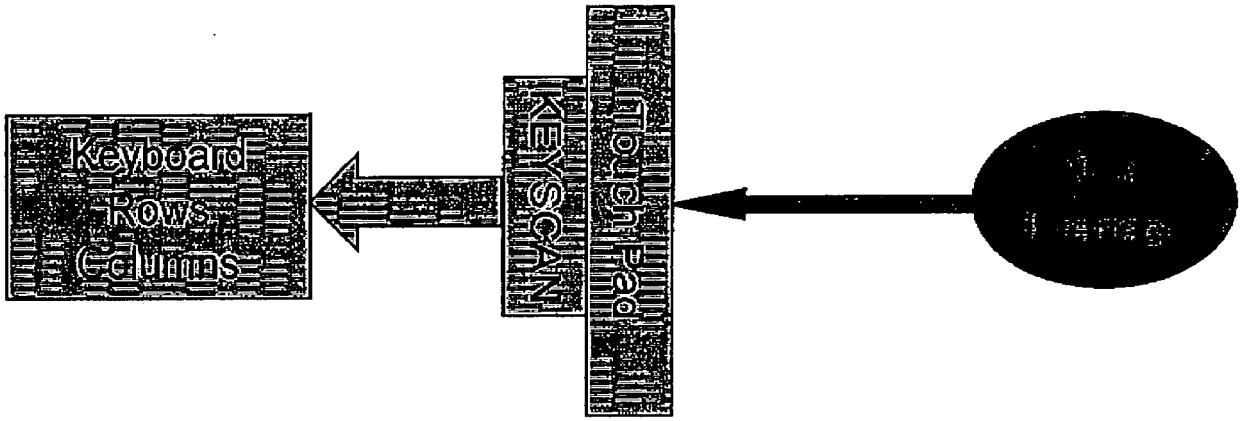
Client Products Group

Current Design



Client Products Group

New Internal I/O Interface



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KEYSCAN / Touchpad

- **Desire to move the KEYSCAN function to the Touch Pad**
  - Frees up pins on the EC/KBC
  - Reduces the cable size to the palm rest
  - Eases assembly
- **New interface between EC/KBC to Touch Pad**
  - Reduced pin count (from KEYSCAN)
- **Opportunity to prepare for Trusted Keyboard / Touch Pad**
  - Trusted interface is not needed, but should be taken into account
  - Need to support HID packets

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What type of electrical interface?

- **Requires multi-master support**
  - Touch Pad needs to initiate message when keys are pressed
- **Needs to be low power**
  - Full USB is a non-started
- **Needs to work with minimal hardware on EC/KBC**
  - This is true when running in trusted mode – Not attached to EC/KBC
- **Single Wire interface? (NSC)**
- **Expand PS/2 interface?**
- **USB LITE interface?**

General Requirements

SPI

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Serial Port

D-Dock Support

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PWM / TACH

PWM In

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Advanced Product Engineering

AD / DA

Client Products Group

Advanced Product Engineering

Dell Confidential

FIR

Client Products Group

Advanced Product Engineering

Dell Confidential

GPIO

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Advanced Product Engineering

Limited RTC

BB RAM

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Advanced Product Engineering

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EEPROM / FLASH / (TPM Ready)

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